BEHAVIOUR OF PROFILED STEEL SHEET FOLDED PLATE WITH DOOR OPENING

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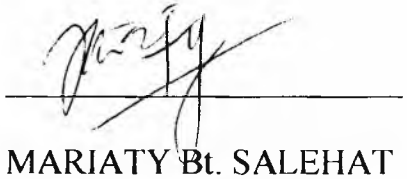
DECLARATION

I hereby declare that the work in this thesis is my own, except quotations and summaries which have been dully acknowledged.



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ABSTRACT

A study on 'The Behaviour Of Profiled Steel Sheet Folded Plate Structure With Door Opening' was carried out in the Civil Engineering Laboratory. The selected profiled steel sheets for the testing are namely called 'Bondek II' (corrugated steel sheet) and the specimen models was made by BHP Steel Building Products (M) Sdn. Bhd. Shah Alam. The Bondek II steel sheeting is roll-formed from hot-dipped, zinc coated, and chromate passivated high-strength grade BHP Zinc Hi-Ten steel strip. Bondek II (corrugated sheet) has sheet thickness t = 1 mm, depth of fold h = 54 mm, sheet width a = 600 mm and length of models is l = 1000 mm.

A compressive test was carried on the Bondek II specimen models. The experimental investigation was on four full–scale models of profiled sheet subjected to in-plane axial compressive loading, P. The model tested included two models without door opening. The size of door opening is 180 mm width and 700 mm height which has been converted from the standard door size of 900 mm width x 2100 mm (3 ft x 7 ft). The results of specimens without opening obtained from the experimental work are used as guide to the specimens with door opening. The parameters measured and determined are lateral deflection, buckling and ultimate load capacity. From the experimental test, the load displacement curve and stress-strain pattern was plotted and identified.

From this study, the ultimate load capacity of compressed profiled steel with door opening was identified to be smaller than that without opening. This may be because the opening reduced the carrying capacity of the models. The openings also tend to increase the deflection of the models. The specimen with opening is noticed to buckle much faster than without opening. It was also found that the buckling shape occurred at different location for each specimen. The average ultimate load capacity for the specimens without opening determined from the

experimental test carried out is 159.95 kN and the ultimate load capacity for the specimens with door opening is 109.15 kN. The average percentage different of ultimate load between specimens without opening and with opening is approximately 32 percent.

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